

# A Drop in the Lake

Level 2



This book belongs to

Here's a cute story about a lapwing. The battle of Kurukshetra was about to begin. Conch shells were sounding, elephants were marching, the archers were getting ready to shoot... Suddenly Lord Krishna heard a lapwing cry. She had built her nest on a hillock in the battlefield and was worried about her babies. Lord Krishna said, "Poor little mother!" and gently lifted a giant elephant bell and placed it over the nest. So, through 18 days of fierce battle, the lapwing and her nestlings were safe!

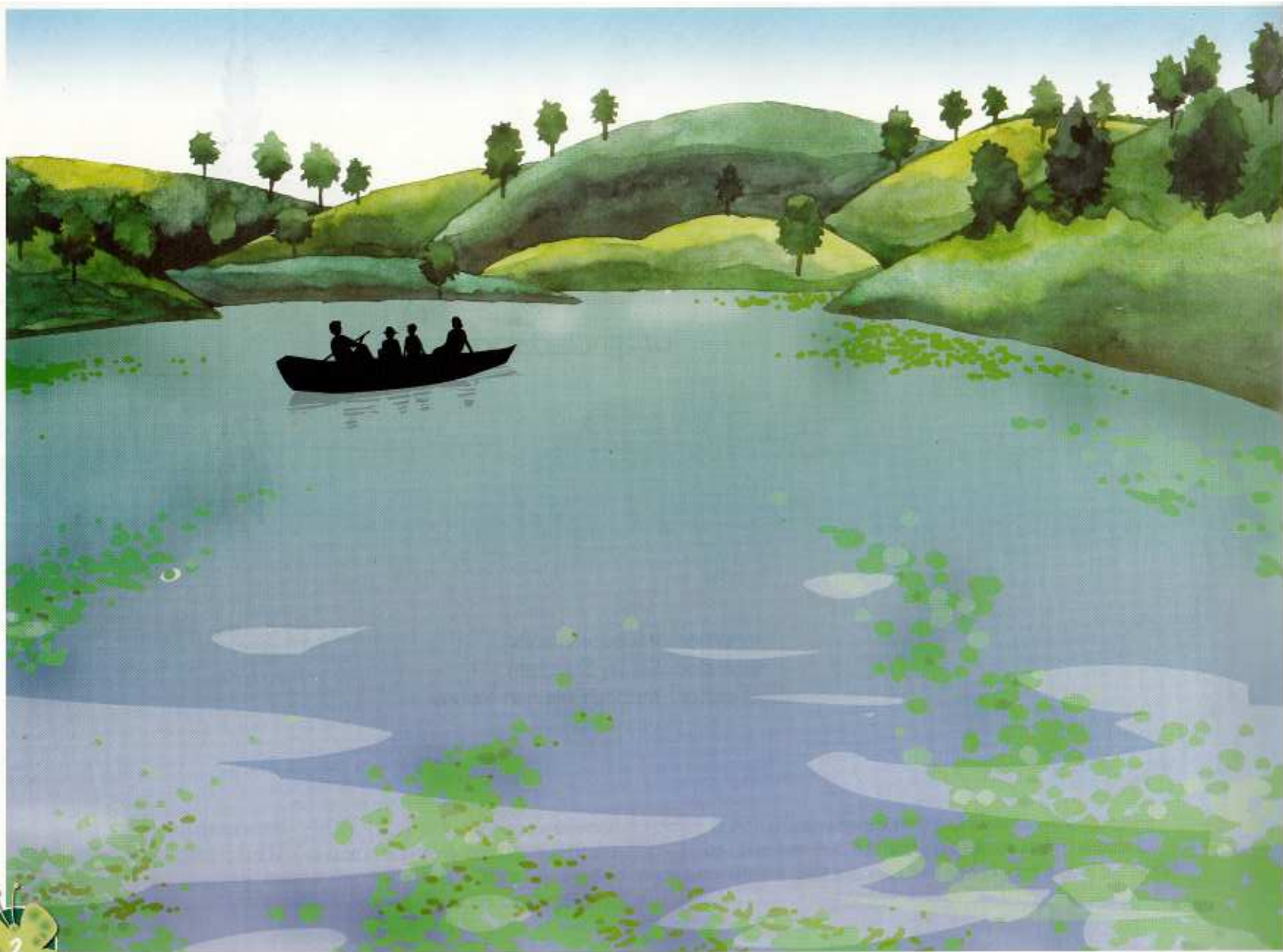
# *A Drop in the Lake*



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“Yuck, it looks awful!” said Kulfi. “And smells awful!” added her brother, Momo. “What on Earth is it?” asked Grandma. They gazed in horror at the water covered with great patches of green scum. They were in the middle of Lake Netravati. Grandma asked the boatman, “Where did this green stuff come from? It wasn’t here last summer!” He replied sadly, “I don’t know, but ever since this green slime appeared, there are less fish in the lake. And they taste bitter, so people don’t buy the fishermen’s catch anymore. Many fishermen have given up fishing and gone away to earn money. Others work in these new tea plantations...” And he waved at the surrounding slopes.



Grandma gazed at the slopes, “These pretty plantations bring jobs and give us tea but I miss the shola that used to cover the hills.” Kulfi asked, “What’s shola, Grandma?” She replied, “Shola is a mixture of woods and meadows. The name ‘Nilgiri’ or ‘Blue Mountains’ comes from a bush called Neelakurunji that grows only in shola grasslands. It flowers once in 12 years, and covers these hills with a carpet of blue flowers. But the way our shola is shrinking, I fear the Nilgiris will soon lose their blueness!”

The boatman nodded. “The lake itself is shrinking. Its water makes us sick unless we boil it before drinking. So our children have to gather more firewood! Times are hard indeed...”





Would-you-do-it?  
Would-you-do-it?



**K**ulfi and Momo were sad and quiet. Kulfi was 10 years old, and Momo was 12. They always spent their summer vacation with Grandma and Grandpa at Chickpur. They loved its cool weather, quiet lanes and pretty gardens. They'd been looking forward to this boat-ride. But the green scum came as a nasty surprise. And it was the second shock of the morning! The first was that the birds around the lake had vanished! There should have been thousands of colourful, noisy birds perched on trees, strutting around or swimming in the water. Grandpa had told them that many of them were migratory birds from China and Russia!

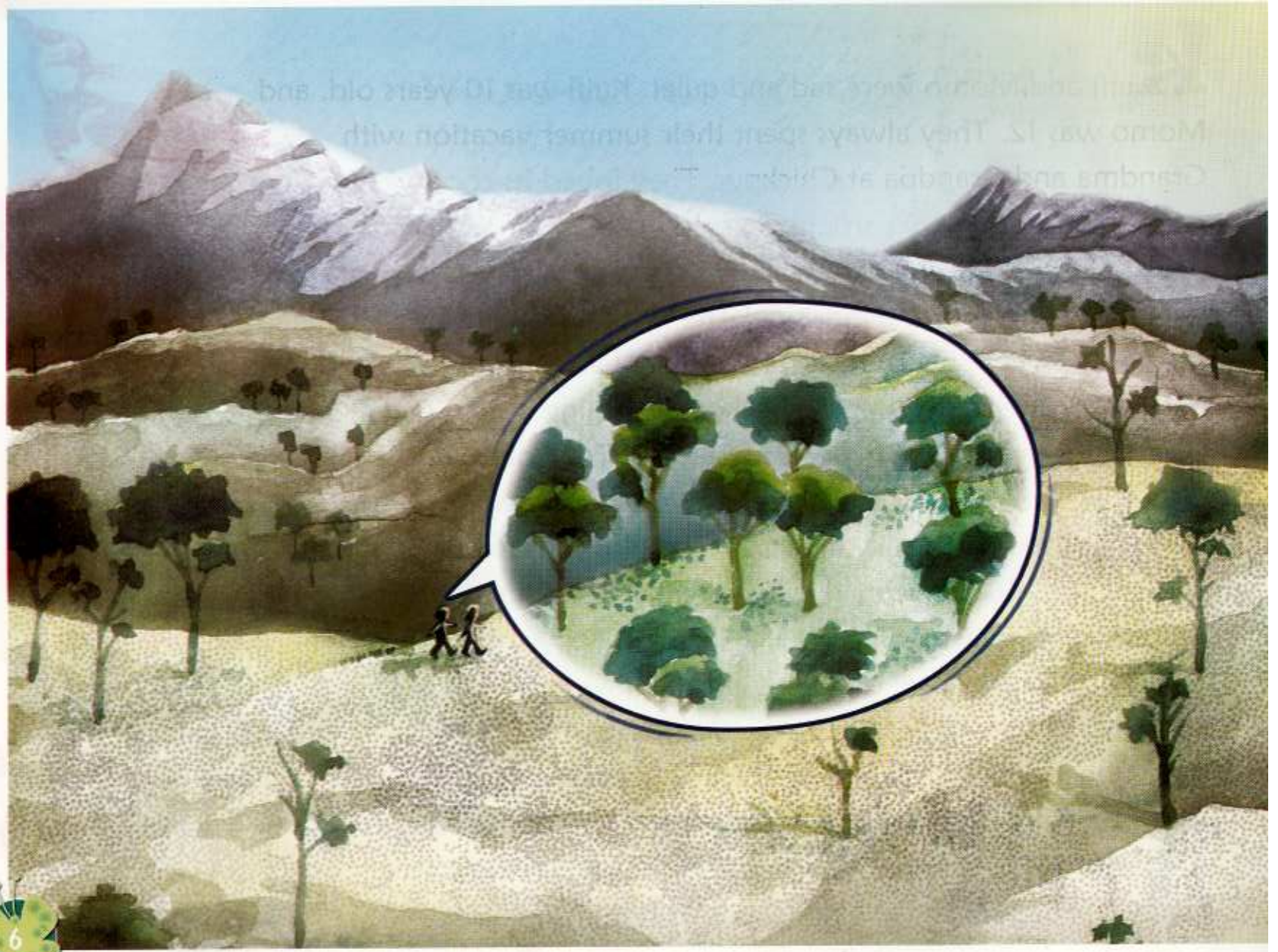


Among them were storks, egrets, flycatchers, cranes, cormorants, and wagtails. Kulfi was especially fond of a little brown-and-white bird with a red beak, called the lapwing. Kulfi loved the way the lapwing strutted up and down the lake's shores, chirping "Would-you-do-it? Would-you-do-it?"

But now there were very few birds—only some sad-looking parakeets and a couple of crows. The children were disappointed. Grandma tried to cheer them up. "Never mind, I'm sure you'll enjoy yourselves in the woods tomorrow!" Momo and Kulfi brightened. "Oh yes, we're going to hike up Walker's Trail!" exclaimed Kulfi, clapping her hands in delight. "I must carry my camera!" said Momo. "I hope it doesn't rain," added Kulfi.









**T**he next day dawned bright. After a hearty breakfast, Kulfi and Momo set off. “Enjoy yourselves, but be back before dark!” said Grandpa. They trudged up Walker’s Trail. “There are fewer trees in the forest,” remarked Momo. Kulfi nodded and said, “I remember those slopes used to be covered with grass... but now they’re all bare and black!” Momo frowned. “Someone set fire to the grass, probably to grow more plantations.”



But, as they climbed, the forest grew thicker and the air became cooler. They passed very few people—some plantation workers, and some boys and girls hurrying down with bundles of dry branches on their heads. After a while, they were deep inside a forest of towering pine trees. Sunlight filtering through the leaves made nice patterns on the ground. Millions of pine needles swished in the breeze, sounding like whispers. “It’s like we’re inside a big hall!” murmured Kulfi.

Momo nodded. “A deep-green concert hall!”

“With a roof of leaves...”

“And a carpet of pine needles...”

“And an audience of a thousand, all whispering angrily because the show’s starting late!” finished Kulfi with a laugh...

They sat on a moss-covered tree trunk, eating Grandma’s sandwiches and drinking orange juice. It was a nice and happy midday.









**d**rinking from her water bottle, Kulfi placed it on a small rock next to her. As she reached into her bag for an apple, the bottle toppled over and rolled down the slope! “Oh! Oh!” she cried, but by the time she scrambled down, all the water had drained away! “Never mind, there’s enough in my bottle,” Momo consoled her.

They moved on slowly. They could hear the merry gurgling of a stream. Soon they reached a grassy meadow covered with small white flowers and bathed in sunshine. Insects hummed and butterflies flitted among the bushes. The air was fragrant with wildflower. They flopped down on the grass.

“Phew! We’ve walked quite a bit,” said Momo, looking at his watch. “It’s just past one, so we’ve got plenty of time. Let’s rest a little and then slowly head back.” He shook his bottle. It was nearly empty. “Want some?” he asked Kulfi. “Thanks, just a sip,” she murmured gratefully. “If only we could get some more water... Hey! There’s a cottage over there!”

“Where?” Momo raised himself on his elbows. “Oh yes, I can see its roof!” On the far side of the meadow, almost hidden by a thick cluster of rhododendrons, they could see a dark wooden roof with a pointed chimney. “Come on, let’s go and ask them for some water!” urged Kulfi.







**i**sn't there something strange about this place?" muttered Momo. "It looks like it hasn't been lived in for years!" "Oh come on! Let's knock!" replied Kulfi. "All right," said Momo, reluctantly. Opening the creaking gate, they walked through the tangle of grass and ferns up to the front door. It opened as soon as they reached it! A little man gazed at them with twinkling eyes. He was nearly bald, with a round face, upturned nose, chubby red cheeks and funny clothes. "Dear dear! Visitors here! At this time of the year! What a pleasure!" he sang. Momo said, "Er...hello, sir, my name is Momo and this is my sister Kulfi. We're spending our holidays down at Chickpur. We've been walking through the forest..."



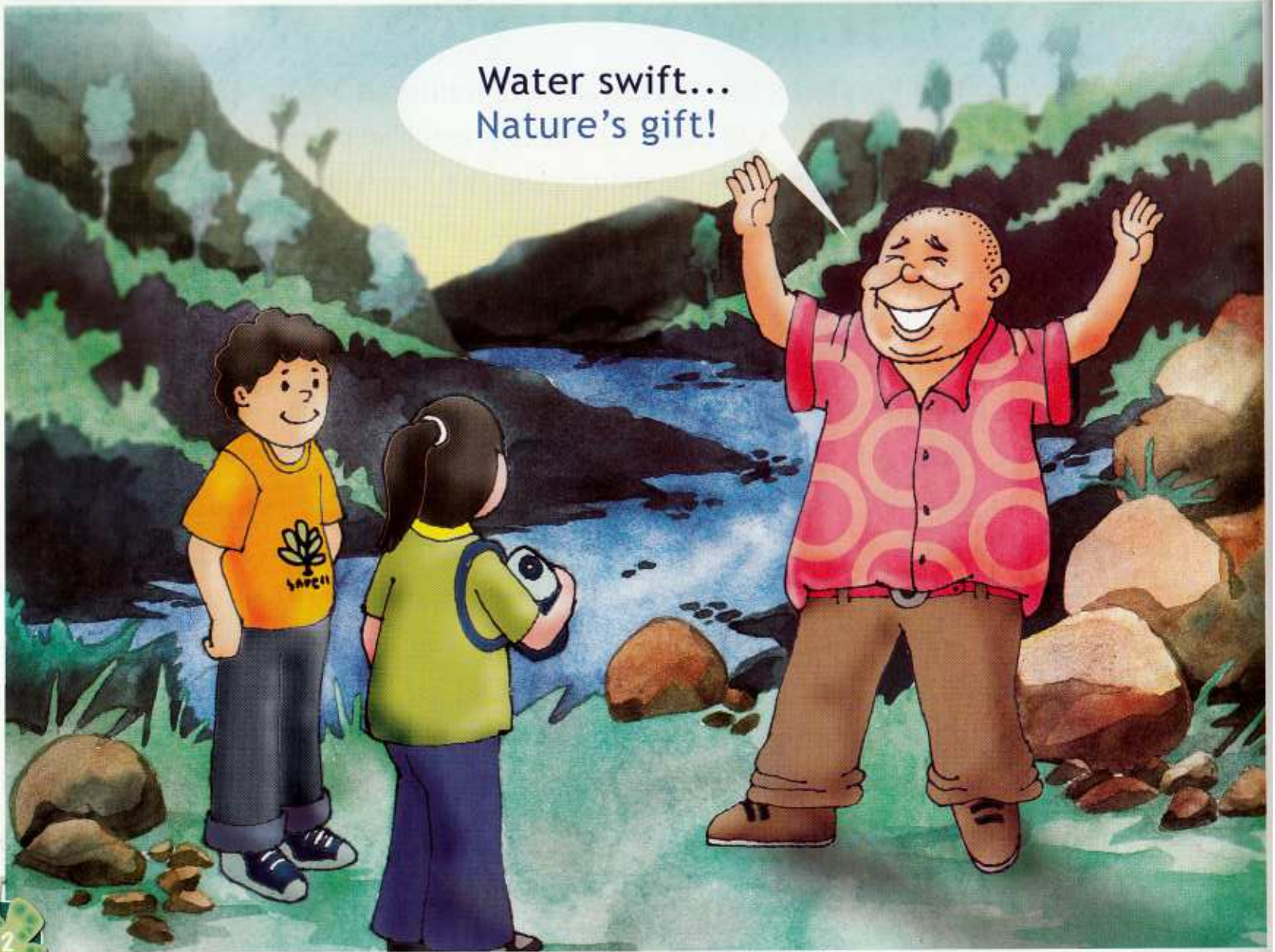
He shook their hands and smiled. "Good for you, what a nice thing to do, it broadens your view!" he exclaimed. "Very happy to meet you, Kulfi and Momo, you may call me Ba Um!" (He pronounced it 'Baa Oom'.) "Thank you, sir...er... Ba Um! Kulfi and I are very thirsty. Could you give us some water?"

"Of course!" cried Ba Um. "I'll give you water to drink...but not from a sink! Follow me! Quench your thirst, water comes first!" But, instead of going into the cottage he stepped out and set off across the overgrown garden. Kulfi looked at Momo, wide-eyed. "He's like a lapwing...a happy lapwing!"





Water swift...  
Nature's gift!





**b**a Um led them to the stream. “Water swift...Nature’s gift!” he cried. A peculiar structure, made of two clay pots, stood there. The upper pot looked like a flowerpot with a clay lid, and the lower pot was spherical. Momo and Kulfi were intrigued.

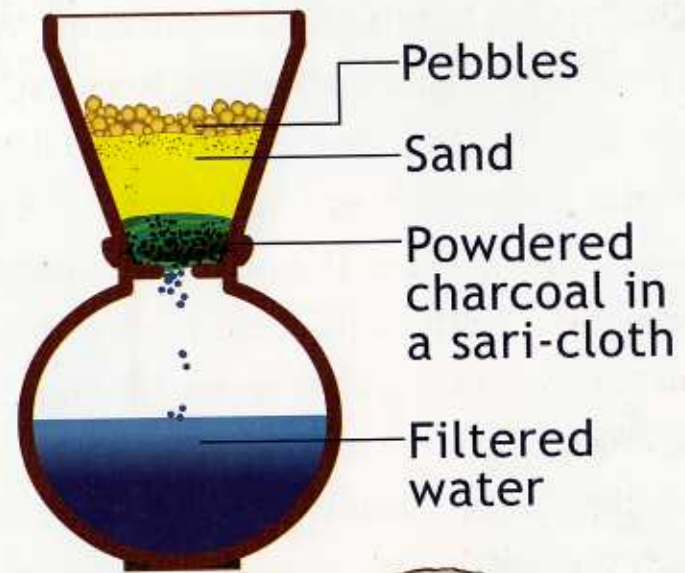
Ba Um removed the lid, picked up a bamboo pipe and placed one end over the mouth of the upper pot. He held the other end against a cleft in the rocks, down which water flowed from a rocky pool. At once water rushed into the upper pot. When the pot was nearly full, Ba Um removed the pipe and replaced the lid. “There! Wait a little and you’ll taste lovely fresh water!”

He went on proudly, “I made this filter myself. I took a piece of fine cloth from an old sari and spread powdered charcoal on it. Then I folded it many times and placed it inside this round pot. Over that I spread sand, and then pebbles. That’s it! The stream water gets cleaned up as it soaks through the pebbles, sand, charcoal and cloth. Finally, it trickles through a hole into the lower pot.”

“Are you sure it’s safe” began Momo. “Of course I’m sure the water’s pure!” replied Ba Um. He prattled on, “Anyway, the stream is very clean here. There are no fields or factories or houses to dirty it. So the water’s almost free of bacteria”



## Ba Um's Water Filter





**b**acteria!” exclaimed Momo. He knew that bacteria could make people sick. “Yes, but trust me, this water’s bacteria-free!” said Ba Um. He filled their bottles and said, “Drink your fill! Enjoy the taste of this merry rill!”



Cautiously, Kulfi took a sip and her eyes widened. The water was cold, fresh and sweet! She gulped it down thirstily. So did Momo. Ba Um’s eyes twinkled as he watched them. “Ooh, that was wonderful!” breathed Kulfi. “Water never tasted so good!” agreed Momo, wiping his mouth. Ba Um laughed, refilled their bottles, replaced the conical pot on top of the round one and sat down again.

“I’m glad you’re careful about the water you drink,” he said. “The safest thing to do is boil water before drinking it but that’s not easy if you’re poor. Village folk have used such a filter for centuries. The pebbles and sand remove particles of dirt and dust; the charcoal and the folds of sari-cloth trap the harmful bacteria. Of course, this filter can’t remove dissolved chemicals. But like I said, there aren’t farms and factories nearby, so the stream is pretty clean up here. Did you know that in Kerala and Tamil Nadu, people keep certain kinds of fish like catfish in their wells and ponds? The catfish eat up bacteria in the water!”

Kulfi asked, “But what are... er... bacteria?”





Soil



Lakes



Rivers



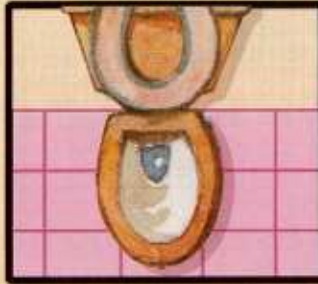
Drains



Cybugs live wherever there is moisture



Marshes



Toilets



Swimming pools



Oceans

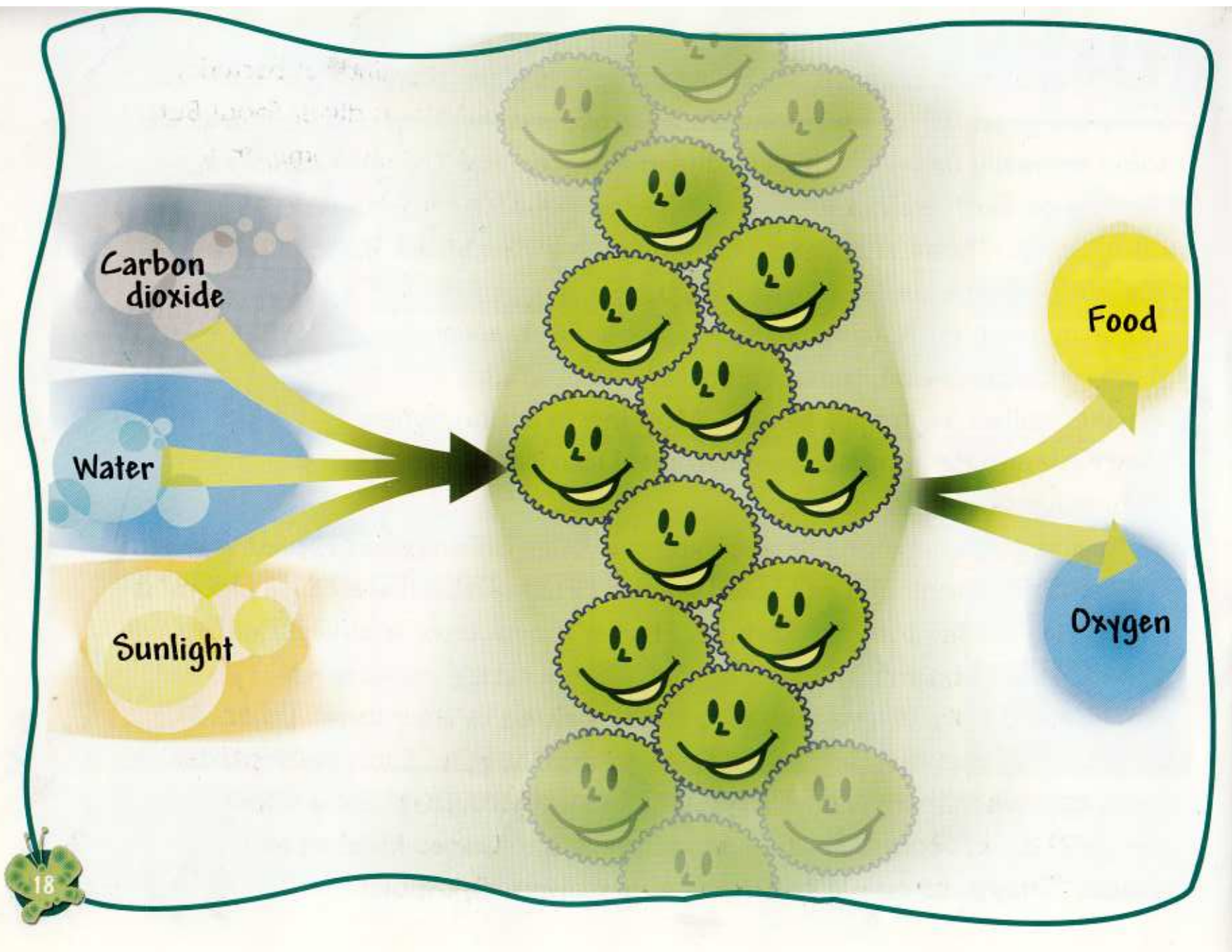


**W**ell, a bacterium is a tiny living thing. There are many kinds of bacteria. Some are good for us—our stomachs have bacteria that help us digest food! But some are really bad—they give us diseases like cholera! The most common bacteria on Earth are cyanobacteria.” (He pronounced it ‘sy-an-oh-bacteria’.) “What a big name for a tiny thing!” said Kulfi. Ba Um said, “Hmmm, let’s call them ‘cybugs’!”

Ba Um went on, “We find cybugs all over Earth, wherever there is moisture—soil, snowfields, lakes, rivers, drains, marshes, toilets, swimming pools... Most live in oceans, where they have another long name—phytoplankton! They usually live in layers on water surfaces.”

“So the green slime on the lake must be cybugs!” Momo said excitedly. When they told him more, Ba Um looked serious. “That sounds like an algal bloom! It means the lake has too many cybugs. Having too much of anything is bad. It upsets Nature’s balance.” Kulfi burst out, “Those cybugs look horrid!” Ba Um said gently, “Never judge Nature’s creatures by their looks. It’s only because of cybugs that we’re alive! They started living on Earth 2000 million years ago, when there was no oxygen.” “How could cybugs live without oxygen?” asked Momo. Ba Um jumped to his feet, waved his arms and yelled, “They lived on water! Water alone makes life possible!”







**S**itting down, Ba Um said: “All living things – the largest whale, the smallest bacterium, even the koala – need water! Besides water, humans need oxygen too but cybugs use carbon dioxide, with water and sunlight, to make food. In the process, they make oxygen!” He leaned forward, “Over the last 2000 million years, cybugs have made almost all the oxygen on Earth!” Momo was puzzled. “But, plants make oxygen too, by photosynthesis!” Ba Um smiled. “Yes, but the chloroplast—the plant’s oxygen-kitchen is actually a cybug!” Then, he leaned back. “I’m talking too much! It’s your turn. Are you enjoying your holiday?”



Momo and Kulfi started to reply at the same time! Momo began, “We’re having a great time!” ... “Though I miss Mummy and Papa...” chipped in Kulfi ... “And we really enjoyed our walk...” “Grandma said we might see birds up here in the woods!” ... “But it’s sad that they’ve burned all the grass on the slopes!” ... “There were so few birds down at the lake.” “And it was a shock to find that green layer on the lake, the cybugs!” ... “Only some parakeets and a couple of doves, which I sketched...” “And our boatman said the lake’s shrinking, and that fish taste bad since the cybugs came!” “And we haven’t seen a single lapwing! I miss them!” said Kulfi sadly.

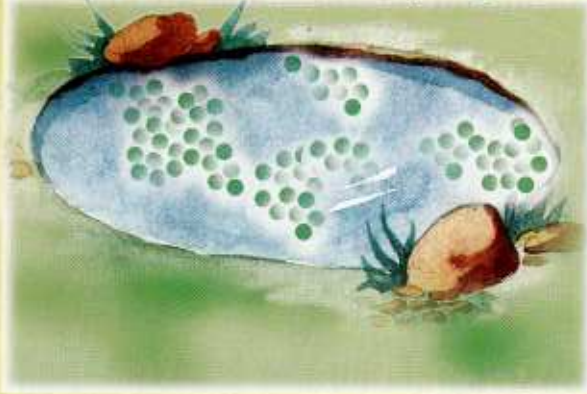
Ba Um shook his head. “It’s worse than I feared! Birds disappearing? The lake shrinking? Surely there’s a problem in the watershed!”





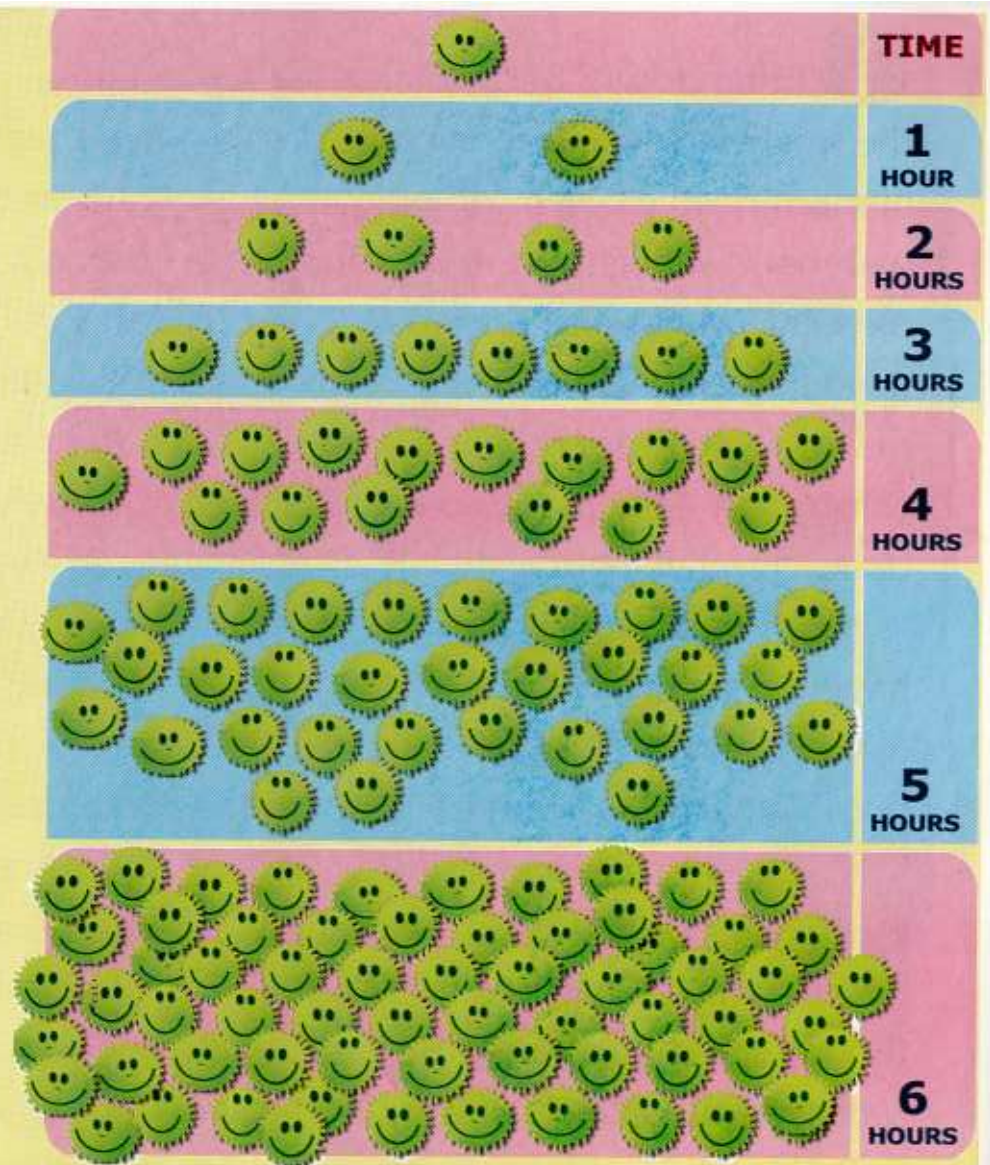
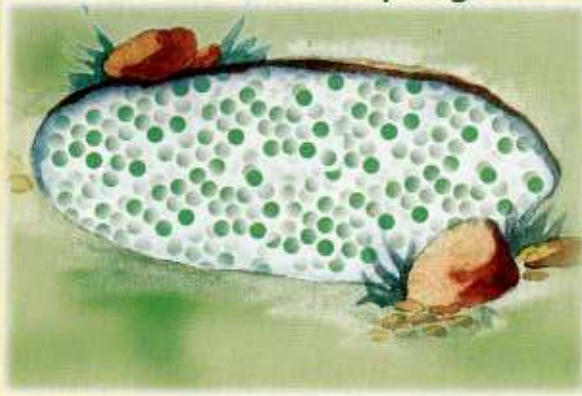
**9 o'clock**

Pool half filled with cybugs



**10 o'clock**

Pool covered with cybugs





**C**urious, Momo asked, "What's a watershed?" Ba Um said, "You might find something about it in the Gallery." Dreamily, he added, "I've been away a very long time... In very far-off places... I didn't see all these changes. But don't worry, Lake Netravati will be clean again in two years." Momo and Kulfi stared at each other. How did he know? Suddenly, Ba Um laughed, "I keep forgetting where I am, even when I am!" Momo asked, "How can cybugs spread so quickly?"

Ba Um said, "Bacteria spread very fast. Let's say a single bacterium gets into this pool, and divides into two after one hour. Each of those then divides into two after one hour, and so on. So, if you come at nine o'clock and half the pool is covered with bacteria, how long will it take for the whole pool to be covered?" After a while, Momo slapped the rock. "I've got it! Ten o'clock!" "Correct!" grinned Ba Um. "But how? ...Oh, I see!" said Kulfi. "Usually," Ba Um went on, "cybugs die as fast as new ones are born. But since your last visit, what's happened to make them multiply rapidly in the lake? That's the real riddle!"

Suddenly, he stood up. "I'm sorry, but I must leave. Lots of work. Please explore the Gallery. Some exhibits are not ready but you'll like the Viewmaster." He raced off towards the cottage, yelling, "Goodbye! I wish I had help in getting those lichen samples! I must get them before the Neutrino Tunnel closes and the Void returns..." Momo gasped, "What does he mean?" "Void? Lichen? Tunnels?" Kulfi giggled. "I think he's crazy...but I like him!"







**M**ystified, they entered and found themselves in a large, circular room. In the middle were two black chairs and a curved table, covered with large, pearly buttons with words shining from inside: Oceans. Forests. Rivers. Life in Cold Places... Momo exclaimed, "This must be the Viewmaster!"

"Let's see how it works," said Kulfi, gently pressing 'Forests'. At once, three buttons lit up: Northern Forests, Tropical Forests, Shola. She touched Northern Forests. Instantly, the light dimmed and they were in the middle of an evergreen forest, with giant, snow-covered trees all around. Yet, amazingly, they were still sitting in the chairs! Icicles quivered, leaves rustled, the wind sighed and a voice spoke, "The Northern Forests bordering the Arctic form a great belt around the Earth 10 000 km long and sometimes 2000 km thick. There are only 30 days a year with enough warmth and sunlight for trees to grow. The rest of the year, cold winds blow, blizzards pile up snow, and temperatures drop to  $-40^{\circ}\text{C}$ . All the water freezes so plants and animals face severe water shortage! Animals usually migrate to warmer regions..."

Abruptly, the forest vanished and they were back in the room. "Incredible!" breathed Momo. "Ooooh, I felt that icy wind in my bones!" shivered Kulfi. "This entire curved wall is a 3-D screen," went on Momo. "So we felt we were actually there in the forest. It's a pretty hi-tech Gallery and that was Ba Um's voice! Let's try something else." And so they wandered through Ba Um's Gallery... Pressing button after button... Absorbed in their explorations...









**S**uddenly, Momo yelled. "The time! My watch has stopped!" It showed 1.15 p.m. "But we were on the meadow just after one o'clock," whispered Kulfi. "It might be dark already!" "Don't worry, we'll reach home safe!" said Momo. "But let's hurry."



They hurried out of the cottage and walked rapidly across the meadow. "At least it's not dark yet," remarked Kulfi. Momo glanced at his watch and stopped short. "I don't believe this...look!" he cried. His watch was running again and it showed 3.35 p.m. Kulfi's eyes widened. She, too, had clearly seen it showing 1.15 p.m. in the cottage!



Momo shrugged helplessly and they moved on. A humming noise filled their ears just as they entered the forest. Kulfi glanced back, and clutched Momo's arm. "Momo!" she cried. "Look! Ba Um's cottage... it's gone!" Momo spun around. There was no sign of the cottage roof. Kulfi's eyes were now as round as saucers. "This is really weird. Let's go!"

As they ran downhill, someone started singing in the distance. The lovely folk song echoed in the hills, as the Sun slowly settled behind them...









**b**ack home, the children quickly bathed and started dinner. Between mouthfuls, they related their adventures to Grandpa and Grandma. “And so, thanks to Ba Um and his Gallery, we’ve figured out why Lake Netravati is polluted!” said Momo. “And also why the lapwings haven’t come this year!” added Kulfi. “It’s really our fault, Grandpa! The plantations use a lot of fertilizers and pesticides, and the rain washes them into the streams that go into the Lake,” said Momo. “And because we’ve cut the shola, a lot of soil has been washed into the Lake too!” ... “And all the nutrients have made the cybugs grow out of control” ... “Maybe sewage is getting into the streams as well.” “Adding more nutrients to feed the cybugs” ... “That green layer we saw is an algal bloom.” ... “Because of which the fish and underwater plants are dying!” ... “And the insects and other tiny things that live on these plants are also dying!” ... “And the birds don’t have anything left to feed on in the Lake or near it, which is why they haven’t come!” ... “So we need to clean up the watershed!” ... “Plant more trees around the lake” ... “And use less fertilizers, or better ones!” ... “Maybe make fertilizer out of sewage?” “And leave the shola alone, and start planting trees again.”

“Well, well, well! You’ve certainly learnt a lot in one day!” murmured Grandpa. “You are right. It’s our fault that the lake is polluted. We must act at once to save it! An awareness campaign, a clean-up drive, every one of us must get involved! Tomorrow, I’ll talk to my friend, who is a member of Chickpur’s Town Council.”







Grandma was still puzzled. “We’ve never heard of this gentleman or this strange Gallery. Where did you say his cottage is?”

“Oh, below a meadow, next to a bunch of trees with red flowers...” said Kulfi. “Wait!” Momo said. “I remember its name—‘Cloud View’!”

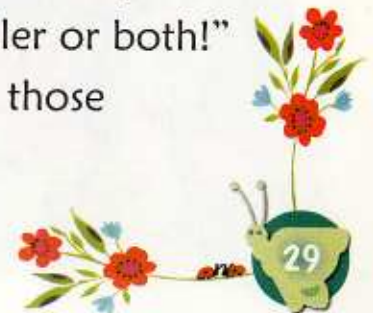
“What!” cried Grandma and Grandpa together. They stared at Momo and Kulfi, and burst out laughing. “What’s so funny?” asked Momo. “Chickpur’s folk remember ‘Cloud View’ very well,” Grandpa said gently. “A retired scientist, Dr Varuna, lived in it all alone for 20 years. After his death, the cottage remained empty. Two years ago, it was struck by lightning and burned to the ground! But on a night when there wasn’t a cloud in the sky!”

“So Ba Um was a ghost?” Kulfi’s voice trembled. “Rubbish!” said Grandma, patting her hand. “There are no ghosts!” Grandpa chuckled. “Well, Ba Um might have been an alien or a time traveller. But, he sounds like a nice man with a lot of sense. That’s what counts!”

The children said goodnight and went to their room. But neither could sleep. They lay whispering. “Ba Um must be a space traveller or a time traveller or both!” said Momo. Kulfi agreed. “Which means that the room we sat in, with those glowing walls and the Viewmaster, must have been his spaceship!”

“Or time machine...”

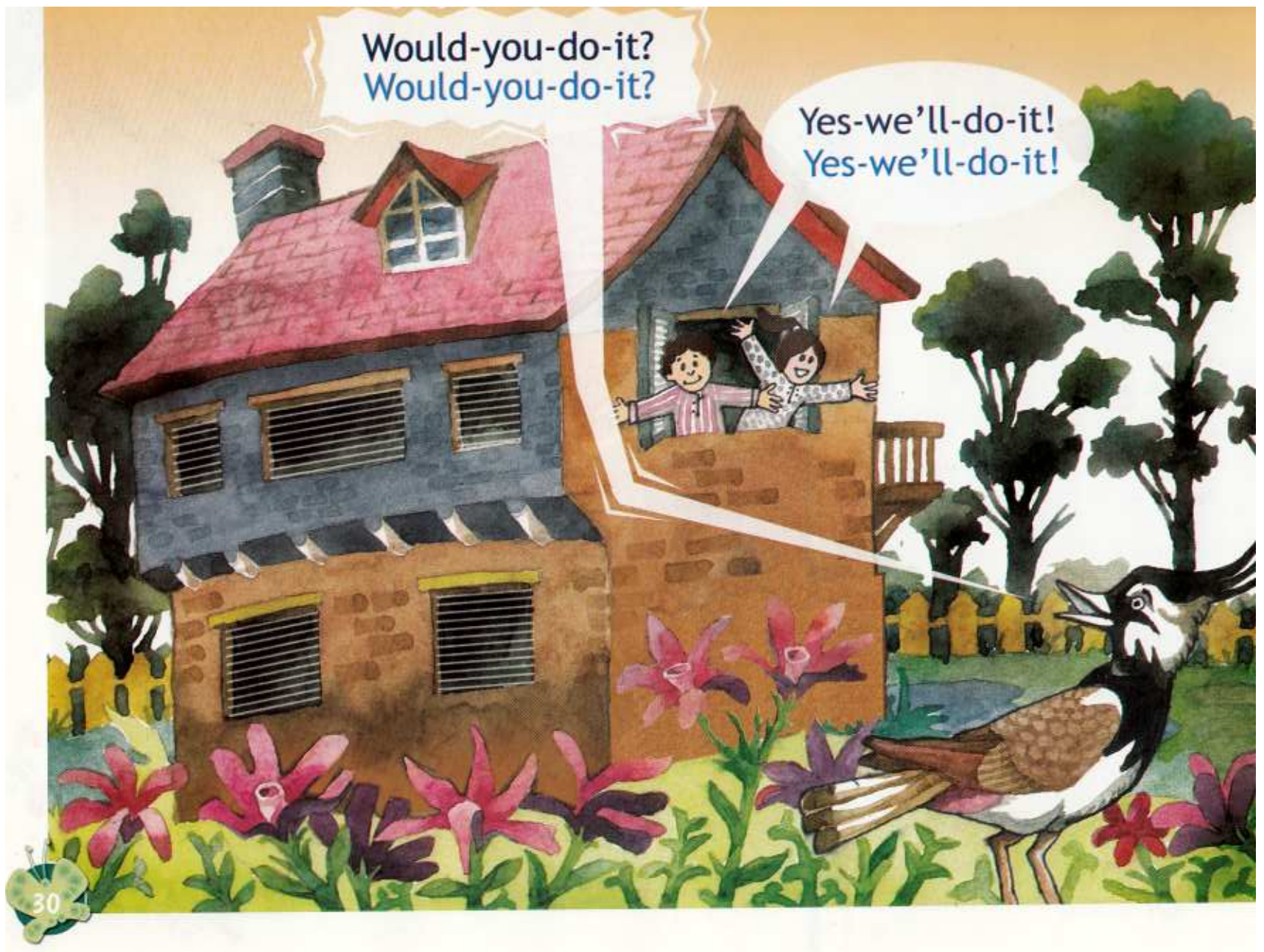
“Or both!”





Would-you-do-it?  
Would-you-do-it?

Yes-we'll-do-it!  
Yes-we'll-do-it!





**K**ulfi didn't know when she drifted off to sleep. When she opened her eyes, the room was filled with a soft light. From the roof above came the gentle patter of rain. She gazed at the window, trying to remember what sound had awakened her...

And then she heard it again. She flung off the blanket and raced barefoot to the window. In a moment, Momo joined her. He too had heard it. Together they stood there, excited and delighted.

Little pools of rainwater lay all over the garden. Strutting about the damp grass was a little brown-and-white bird. Occasionally, it paused to poke its red beak into a flowerbed or a clump of grass. It was a lapwing, of course. Even as they watched, it chirped its familiar call.

"Would-you-do-it? Would-you-do-it?"

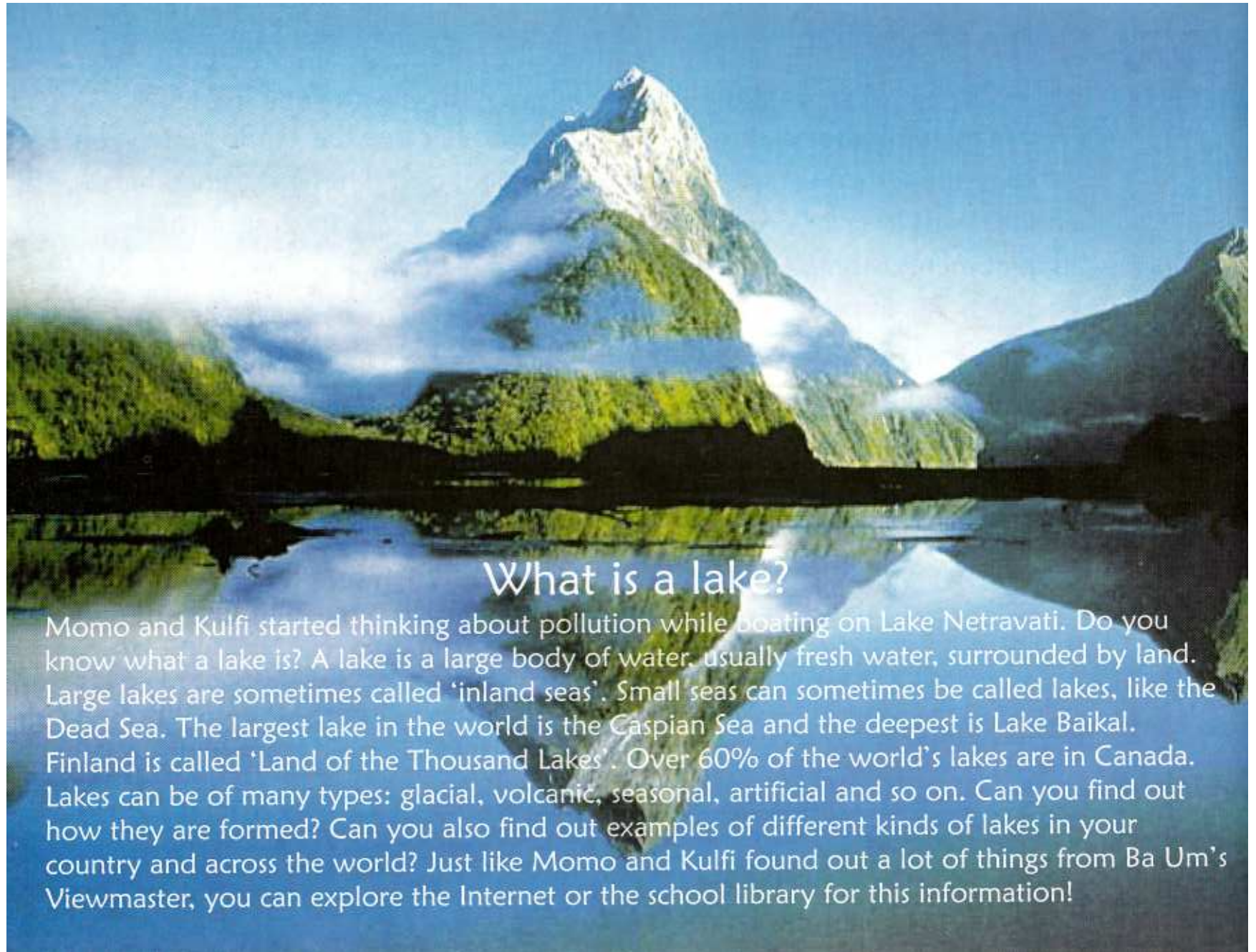
Kulfi's eyes sparkled. "A lapwing! At last!"

"All the other birds will also come back if we clean up the lake," said Momo.

"Would-you-do-it? Would-you-do-it?" chirped the lapwing.

"Yes-we'll-do-it! Yes-we'll-do-it!" chirped back Kulfi and Momo!



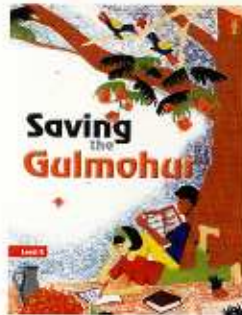


## What is a lake?

Momo and Kulfi started thinking about pollution while boating on Lake Netravati. Do you know what a lake is? A lake is a large body of water, usually fresh water, surrounded by land. Large lakes are sometimes called 'inland seas'. Small seas can sometimes be called lakes, like the Dead Sea. The largest lake in the world is the Caspian Sea and the deepest is Lake Baikal. Finland is called 'Land of the Thousand Lakes'. Over 60% of the world's lakes are in Canada. Lakes can be of many types: glacial, volcanic, seasonal, artificial and so on. Can you find out how they are formed? Can you also find out examples of different kinds of lakes in your country and across the world? Just like Momo and Kulfi found out a lot of things from Ba Um's Viewmaster, you can explore the Internet or the school library for this information!



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